

WHAT IS CLAIMED IS:

1. An electrical distribution board that stores ends of a signal cable connected to a communication network and an electrical power cable connected to electrical distribution cables, the electrical distribution board comprising:

in-building electrical distribution breakers inserted between the electrical power cable and the in-building distribution cables;

a gateway that interfaces the communication network with the in-building network; and

a plurality of optical repeaters, each having a bi-directional conversion function between an electrical signal and an optical signal between an electrical signal input/output terminal and an optical signal input/output terminal, and having an electrical signal input/output terminal that is connected to an electrical signal input/output terminal for in-building network connection of the gateway, wherein the optical signal input/output terminal is connected to an optical fiber cable of the in-building network.

2. An electrical distribution board that stores an end of an electrical power cable connected to electrical distribution cables, the electrical distribution board comprising:

an in-building electrical distribution breaker inserted between the electrical power cable and in-building electrical distribution cables;

a gateway that interfaces the communication network with the in-building network; and

a plurality of optical repeaters, each having a bi-directional conversion function between an electrical signal and an optical signal between an electrical signal input/output terminal and an optical signal input/output terminal, and having an electrical signal input/output terminal that is connected to an electrical signal input/output terminal for in-building network connection of the gateway, wherein the optical signal input/output terminal is connected to an optical fiber cable of the in-

building network, and wherein the gateway is externally attached to a casing that stores the in-building electrical distribution breakers and the optical repeaters.

3. An electrical distribution board according to claim 1 or claim 2, wherein the plurality of optical repeaters are connected in daisy chain through electrical signal input/output terminals.

4. An electrical distribution board according to claim 1 or claim 2, wherein the plurality of optical repeaters are connected in a tree-form through electrical signal input/output terminals.

5. An electrical distribution board according to any one of claim 1 through claim 3, wherein the electrical signal input/output terminals are IEEE 1394 serial interface cable connection terminals.

6. An electrical distribution board according to any one of claim 1 through claim 3, wherein each of the optical repeaters is isolated in terms of network from an upstream-side of the distribution board by a bridge function.

7. A junction box for in-building network that stores an end of an in-building complex cable including an in-building electrical distribution cable and an optical fiber cable, comprising:

a distribution apparatus that is connected to the in-building electrical distribution cable and distributes the in-building electrical distribution cable; and

an optical repeater having a bi-directional conversion function between an electrical signal and an optical signal between an electrical signal input/output terminal and an optical signal input/output terminal, wherein

an optical fiber cable on an electrical distribution board side is connected to one of the optical signal input/output terminals and an optical fiber cable on an outlet box side is connected to the other of the optical signal input/output terminals.

8. A junction box according to claim 7, wherein the optical repeaters in plurality are connected in daisy chain through electrical signal input/output terminals.

9. A junction box according to claim 7, wherein the optical repeaters in plurality are connected in a tree-form through electrical signal input/output terminals.

10. A junction box according to claim 7 or claim 8, wherein the electrical signal input/output terminals are IEEE 1394 serial interface cable connection terminals.

11. A junction box according to claim 7 or claim 8, wherein at least one of the optical repeaters at an uppermost level has a bridge function whereby the network on an upstream side of the optical repeater at the uppermost level isolated in terms of network from the network on a downstream side of the optical repeater.

12. An outlet box that stores an end of an in-building complex cable including an in-building electrical distribution cable and an optical fiber cable, comprising: an electrode plug receptor section that is connected to the in-building electrical distribution cable; a plurality of optical repeaters, each having a bi-directional conversion function between an electrical signal and an optical signal between an electrical signal input/output terminal and an optical signal input/output terminal and having an optical signal input/output terminal that is connected to the optical fiber cable; and a serial interface cable connection terminal that is

connected to an electrical signal input/output terminal of the optical repeater.

13. An outlet box according to claim 12, wherein the plurality of optical repeaters are connected in daisy chain through electrical signal input/output terminals, the optical repeater being equipped with a serial interface cable connection terminal.

14. An outlet box according to claim 12, wherein the plurality of optical repeaters are connected in a tree-form through electrical signal input/output terminals.

15. An outlet box according to claim 12 or claim 13, wherein the electrical signal input/output terminals are IEEE 1394 serial interface cable connection terminals.

16. An outlet box according to claim 12 or claim 13, wherein at least one of the optical repeaters at an uppermost level has a bridge function whereby the network on an upstream side of the optical repeater at the uppermost level is isolated in terms of network from the network on a downstream side of the optical repeater.

17. A plug with electrical code, the plug being connected to one end of an electrical code including a power supply line that supplies power source electrical power to an appliance and a signal cable that connects the appliance and an in-building network, and comprising an electrode plug that is electrically connected to the power supply line and a serial interface plug that is electrically connected to the signal cable.

18. A plug with electrical cord according to claim 17, wherein the signal cable is an IEEE 1394 serial interface cable.

19. A plug with electrical cord according to claim 17, wherein an entire length of the serial interface plug is longer than an entire length of the electrode plug.

20. A plug with electrical cord according to claim 17, wherein an entire length of the serial interface plug is shorter than an entire length of the electrode plug.

21. A plug with electrical cord, the plug being connected to one end of an electrical cable including a power supply line that supplies power source electrical power to an appliance and a signal cable that connects the appliance and an in-building network, and comprising an electrode plug that is electrically connected to the power supply line and an optical connector that is connected to the optical fiber cable.

22. A plug with electrical cable according to claim 21, wherein an entire length of the optical connector is shorter than an entire length of the electrode plug.

23. A plug with electrical cord according to claim 21, wherein an entire length of the optical connector is longer than an entire length of the electrode plug.

24. An outlet box terminal board to be connected to a plug with electrical cord, the plug being connected to one end of an electrical cord including a power supply line that supplies power supply electrical power to an appliance and a signal cable that connects the appliance and an in-building network and comprising an electrode plug that is electrically connected to the power supply line and a serial interface plug that is electrically connected to the signal cable, the outlet box terminal board comprising: an electrode plug receptor section that is connected to an in-building electrical distribution cable and receives the electrode plug, and a

serial interface cable connection terminal that is disposed adjacent the electrode plug receptor section and connected to an electrical signal input/output terminal of an optical repeater and receives the serial interface plug.

25. An outlet box terminal board according to claim 24, wherein the electrical signal input/output terminal is an IEEE 1394 serial interface cable connection terminal.

26. An outlet box terminal board according to claim 24, wherein at least one of the optical repeaters at an uppermost level has a bridge function whereby the network on an upstream side of the optical repeater at the uppermost level isolated in terms of network from the network on a downstream side of the optical repeater.

27. An in-building network system comprising:
an electrical distribution board that receives an electrical power cable that is connected to an electrical distribution line and a signal cable that is connected to a network, and an outlet box that is connected to the electrical distribution board through in-building complex cables including an electrical distribution cable and an optical fiber cable, wherein the outlet box is equipped with an electrical plug receptor section that connects to an electrical plug and an optical fiber connector receptor section that receives an optical fiber connector; and

a gate that opens an opening section of the optical fiber connector receptor section when a tip of the electrical plug is inserted in the electrical plug receptor section and closes the opening section of the optical fiber connector receptor section when the tip of the electrical plug is pulled out the electrical plug receptor section.

28. An in-building network system according to claim 24 or claim 27, wherein the electrical signal input/output terminal is an IEEE 1394 serial interface cable connection terminal.

29. An in-building network system comprising:

an electrical distribution board that stores a signal cable connected to a communication network and an electrical power cable connected to electrical distribution cables, the electrical distribution board comprising in-building electrical distribution breakers inserted between the electrical power cable and in-building electrical distribution cables, a gateway that interfaces between the communication network and the in-building network, and a plurality of optical repeaters, each having a bi-directional conversion function between an electrical signal and an optical signal and having an electrical signal input/output terminal that is connected to an electrical signal input/output terminal for in-building network connection of the gateway and an optical signal input/output terminal that inputs and outputs a signal corresponding to an electrical signal provided by the bi-directional conversion function and is connected to an optical fiber cable of the in-building network; and

an outlet box that stores an end of an in-building complex cable including the in-building electrical distribution cable and the optical fiber cable, the outlet box comprising an electrode plug receptor section that is connected to the in-building electrical distribution cable, a plurality of optical repeaters, each having a bi-directional conversion function between an electrical signal and an optical signal and having an optical signal input/output terminal that is connected to the optical fiber cable and an electrical signal input/output terminal that inputs and outputs an electrical signal corresponding to the optical signal provided by the bi-directional conversion function, and a pair of serial interface cable connection terminals that is connected to the electrical signal input/output terminal of the optical repeater.

30. An in-building network system comprising:

an electrical distribution board that stores a signal cable connected to a communication network and an electrical power cable connected to electrical distribution cables, the electrical distribution board comprising in-building electrical distribution breakers inserted between the electrical power cable and in-building electrical distribution cables, a gateway that interfaces between the communication network and the in-building network, and a plurality of optical repeaters, each having a bi-directional conversion function between an electrical signal and an optical signal and having an electrical signal input/output terminal that is connected to an electrical signal input/output terminal for in-building network connection of the gateway and an optical signal input/output terminal that inputs and outputs a signal corresponding to an electrical signal provided by the bi-directional conversion function and is connected to an optical fiber cable of the in-building network; and

an outlet box that stores an end of an in-building complex cable including the in-building electrical distribution cable and the optical fiber cable, the outlet box comprising an electrode plug receptor section that is connected to the in-building electrical distribution cable, a plurality of optical repeaters, each having a bi-directional conversion function between an electrical signal and an optical signal and having an optical signal input/output terminal that is connected to the optical fiber cable and an electrical signal input/output terminal that inputs and outputs an electrical signal corresponding to the optical signal provided by the bi-directional conversion function, and a serial interface cable connection terminal that is connected to the electrical signal input/output terminal of the optical repeater.

31. An in-building network system comprising:

an electrical distribution board that stores an end of an electrical power cable connected to an electrical distribution cable, the electrical distribution board comprising in-building electrical distribution breakers

inserted between the electrical power cable and an in-building electrical distribution cable, a gateway that interfaces between the communication network and the in-building network, a plurality of optical repeaters, each having a bi-directional conversion function between an electrical signal and an optical signal between an electrical signal input/output terminal and an optical signal input/output terminal, and having an electrical signal input/output terminal that is connected to an electrical signal input/output terminal for in-building network connection of the gateway, wherein the optical signal input/output terminal is connected to an optical fiber cable of the in-building network, and wherein the gateway is externally attached to a casing that stores the in-building distribution breaker and the optical repeater; and

an outlet box that stores an end of an in-building complex cable including the in-building electrical distribution cable and the optical fiber cable, the outlet box comprising an electrode plug receptor section that is connected to the in-building electrical distribution cable, a plurality of optical repeaters having a bi-directional conversion function between an electrical signal and an optical signal and having an optical signal input/output terminal that is connected to the optical fiber cable and an electrical signal input/output terminal that inputs and outputs an electrical signal corresponding to the optical signal provided by the bi-directional conversion function, and a serial interface cable connection terminal that is connected to the electrical signal input/output terminal of the optical repeater.

32. An in-building network system according to any one of claim 29 through claim 31, wherein each of the electrical distribution board and the outlet box is equipped with an independent power supply source for driving the optical repeater stored therein.

33. An in-building network system according to any one of claim 29 through claim 31, wherein each of the electrical distribution board and

the outlet box is equipped with an independent power supply source for driving the optical repeater stored therein, wherein electrical power is supplied to the independent power supply source from the in-building electrical distribution cable.

34. A table tap comprising:

an electrical cord including a power supply line that supplies power supply electrical power to an appliance and a signal cable that connects the appliance and an in-building network;

a plug connected to one end of the electrical cord and having an electrode plug that is electrically connected to the power supply line and a serial interface plug that is electrically connected to the signal cable; and

a tap that is connected to the other end of the electrical cord and having an electrode plug receptor section that is electrically connected to the power supply line and a serial interface cable connecting terminal that is electrically connected to the signal cable.

35. A table tap comprising:

an electrical cord including a power supply line that supplies power supply electrical power to an appliance and an optical fiber cable that connects the appliance and an in-building network;

a plug connected to one end of the electrical cord and having an electrode plug that is electrically connected to the power supply line and a male optical connector that is connected to the optical fiber cable; and

a tap that is connected to the other end of the electrical cord and having an electrode plug receptor section that is electrically connected to the power supply line and an optical fiber connector receptor section that is connected to the optical fiber cable.

36. An in-building network system comprising:

an electrical distribution board that receives an electrical power cable that is connected to an electrical distribution line and a signal cable that is connected to a network and an outlet box that is connected to the electrical distribution board through in-building complex cables including an electrical distribution cable and an optical fiber cable,

wherein the outlet box stores an end of the in-building complex cable and having an electrode plug receptor section that is connected to the in-building electrical distribution cable and a serial interface cable connection terminal for in-building network;

an electrical cord including a power supply line that supplies power supply electrical power to an appliance and a signal cable that connects the appliance and the in-building network;

a plug to be connected to the outlet box, being provided at one end of the electrical cord, and having an electrode plug that is electrically connected to the power supply line and a serial interface plug that is electrically connected to the signal cable; and

an appliance that is connected to the other end of the electrical cord.

37. An in-building network system comprising:

an electrical distribution board that receives an electrical power cable that is connected to an electrical distribution line and a signal cable that is connected to a network and an outlet box that is connected to the electrical distribution board through an in-building complex cable including an electrical distribution cable and an optical fiber cable,

wherein the outlet box stores an end of the in-building complex cable and having an electrode plug receptor section that is connected to the in-building electrical distribution cable and an optical fiber connector receptor section for in-building network;

an electrical cord including a power supply line that supplies power supply electrical power to an appliance and an optical fiber cable that connects the appliance and the in-building network;

a plug to be connected to the outlet box, being provided at one end of the electrical cord, and having an electrode plug that is electrically connected to the power supply line and an optical fiber connector that is connected to the optical fiber cable; and

an appliance that is connected to the other end of the electrical cord.